

## ATT3\_SWF\_WorkPlan\_1of1

### Attachments to this Section:

- Project Elements Table
- Maps/Figures of the project location
- Map demonstrating that the project is not part of the State Plan of Flood Control
- Todd Engineers Figure 14 Selected Hydrographs
- Todd Engineers Figure 16 Water Level Contour Map 1951 - USGS Water Supply Paper 1427, Plate 2 (Cardwell, 1958)

## Attachment 3 Work Plan

GENERAL INFORMATION: Project Name	
Project Title	Copeland Creek Enhancement and Restoration Project: Detention and Recharge Basins
Project Abstract	<p>The Sonoma County Water Agency in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the City of Rohnert Park, Sonoma State University (SSU), the Conservation Corps North Bay and the University District, LLC proposes to implement a regionally integrated project in the Copeland Creek Watershed between Highway 101 at Rohnert Park east to Crane Creek Regional Park. This public-private partnership intends to accomplish the following objectives:</p> <ul style="list-style-type: none"> <li>• Stormwater detention of up to 200 acre-feet in up to three off-stream basins located in the alluvial fan east of Petaluma Hill Road that will provide regional flood protection and 150 acre-feet or more annual groundwater recharge potential.</li> <li>• Riparian habitat restoration along up to 16,000 linear feet of Copeland Creek.</li> <li>• Removal of up to 11,000 cubic yards of sediment and re-contouring of up to 2 miles of channel bottom, and construction of sediment collection basins to detain fine sediment from roads, erosion, and other upland sources that otherwise would be deposited onto the streambed.</li> <li>• Provision of off-channel refuge in the mid-reach of Copeland Creek to protect listed juvenile steelhead against high flow events.</li> <li>• Protection of water quality for salmonids.</li> <li>• Increase of 75 to 90 acres of permanent preserved open space.</li> <li>• Construction of more than 6,000 linear feet of public trails and bike paths along Copeland Creek from SSU east to Crane Creek Regional Park, and west toward Highway 101 to provide a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.</li> </ul> <p>The project will improve flood protection, reduce sediment deposition downstream, recharge groundwater, improve groundwater supply reliability, improve salmonid habitat, provide salmonid refugia off-stream, conserve energy resulting from reduced pumping, and create a site for public access and education about hydrology, fish, and watershed geomorphic processes.</p>
Organization	Sonoma County Water Agency
Contact Name and Title	Kent Gylfe, Principal Engineer
Watershed	Copeland Creek
County	Sonoma
Status of project design and bid solicitation efforts	Riparian habitat restoration is ready to proceed; Conservation Corps North Bay will assist the Sonoma County Water Agency in implementing the field work (agreement between Sonoma County Water Agency and North Bay Conservation Corps has been executed). The Water Agency will complete the 30, 60, & 90% storm water detention basin design and environmental review pending Proposition 84 Implementation Funds.
Titles of Plans and Specifications submitted in hard copy format	Drawings and plans for Copeland Creek habitat enhancement and restoration.

<b>GENERAL INFORMATION: Project Name</b>	
Status of CEQA, NEPA, and other environmental laws and work complete prior to grant execution	Riparian habitat restoration CEQA process is complete; a certified CEQA EIR exists for the proposed site locations for the storm water detention basins. Because the storm water detention basins were not included in the CEQA project description, additional CEQA documentation is required. The Proposition 1E Project will advance the CEQA documentation from 90% complete to final EIR. See attached Project Elements Table for additional information.
Merits of the building materials or computational methods that were or will be used for project development such as use of specific grades of building materials or use of specific, tested, and established models (or software).	Hydraulic modeling will be performed for storm water detention basin design. Sonoma County Water Agency Stream Maintenance Program (SMP) Manual developed in collaboration with an Inter-Agency Working Group (IAWG) including: U.S. Army Corps of Engineers, North Coast Regional Water Quality Control Board, San Francisco Bay Water Quality Control Board, California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency. The IAWG reviewed the document and provided input. Habitat enhancement/riparian restoration and sediment removal activities are described in detail in the SMP manual.
Procedures for coordination with partner agencies and organizations	Monthly conference calls, quarterly meetings, and submission of design and environmental documents at key milestones for review and comment.
A description of synergies or linkages among projects	<p>The Sonoma County Water Agency in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the County of Sonoma, the City of Rohnert Park, Sonoma State University, the Conservation Corps North Bay and the University District, LLC proposes to implement a regionally integrated project in the Copeland Creek Watershed. The Project will:</p> <ul style="list-style-type: none"> <li>• Provide storm water detention of up to 200 acre-feet in off-stream basins located in the alluvial fan east of Petaluma Hill Road with 150 acre-feet or more annual groundwater recharge potential.</li> <li>• Assist in juvenile steelhead migration by providing off-channel refuge during high-flow events in the mid-reach of Copeland Creek. The project also protects water quality for salmonids by detaining fine sediment from roads, erosion, and other upland sources that otherwise would be deposited onto the streambed.</li> <li>• Provide regional flood protection, creek habitat enhancement, and preservation of permanent open space.</li> <li>• Engage the Sonoma County Water Agency, Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the City of Rohnert Park, Sonoma State University, the Conservation Corps North Bay and the University District, LLC in an ongoing, inclusive framework for efficient intra-regional cooperation, planning and project implementation.</li> </ul> <p>The projects will culminate in cumulative habitat improvement and storm water management benefits to the region.</p> <p>Construction of storm water detention basins sited to capture runoff from the Copeland Creek headwaters will reduce the impacts of future 100 year floods upon the regional downstream properties and structures. The regional and local impacts of a 100 year flood have been determined to affect at least one – quarter of the downstream City of Rohnert Park including Sonoma State University, Rancho Cotati High School, businesses, residences, and adjoining City arterial roadways, such as Rohnert Park Expressway and Snyder Lane.</p> <p>Historical groundwater level declines in the region have been a concern to many groundwater users in the area. The storm water detention/groundwater recharge basins would be located over one of the few areas within the southern Santa Rosa Plain groundwater basin ranked as having a high potential for groundwater recharge, making it ideal in its potential to enhance the replenishment of local groundwater supplies. The groundwater benefits of the proposed project will be increased by the City of Rohnert Park's NCIRWMP Urban Reuse Expansion Project that</p>

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	will offset the need for potable water by providing recycled water to Rohnert Park and ultimately the Cities of Santa Rosa and Cotati.
Status of acquisition of land or rights-of-way, if applicable	1) Sonoma County Water Agency owns the land containing Copeland Creek between Highway 101 and Sonoma State University, and has access rights to land along Copeland Creek east of Sonoma State University (SSU) where habitat enhancement and trail restoration work will be performed. 2) SSU owns its land and is a project partner to an existing Sonoma County Agricultural Preservation and Open Space District grant for trail construction. 3) The basins will be constructed on 53 acres of land east of Petaluma Hill Road that is in the process of being acquired through an agreement between two project partners, the City of Rohnert Park and UD LLC. UD LLC is the property owner and has offered the 53 acres of land for dedication to the City of Rohnert Park as well as an easement across the balance of the 128 acre property for the public access trail. 4) The remaining 75 acres (balance of the 128 acre property) is also being made available by project partner UD LLC, pending negotiation of terms between the project partners.
Standards, such as construction standards that will be used in implementation	<ul style="list-style-type: none"> <li>• Best Management Practices that will be implemented for sediment removal, revegetation, invasive species removal and bank stabilization are identified in Tables 7-1 and 7-2 of the Sonoma County Water Agency Stream Maintenance Program Manual.</li> <li>• Numerous construction standards including: ASTM, AWWA, Caltrans, UBC, UPC, CBC, CMC, CEC, CCR. Examples include, but are not limited to: <ul style="list-style-type: none"> <li>-ASTM D 1557 Tests for Moisture-Density Relations of Soils and Soil Aggregate Mixtures</li> <li>- California Building Code Appendix Chapter 33 Excavation and Grading</li> <li>- California Test Method 216 (mod) Relative Compaction of Untreated and Treated Soils and Aggregates</li> <li>- California Test Method 202 Sieve Analysis of Fine and Coarse Aggregates</li> <li>- California Test Method 217 Sand Equivalent</li> <li>- California Test Method 229 Durability Index</li> <li>- California Test Method 231 (mod) Relative Compaction of Untreated/Treated Soils and Aggregates (Area Concept Utilizing Nuclear Gauges)</li> <li>- Caltrans 26 Aggregate Base</li> <li>- Caltrans 72-2.02 Rock Slope Protection, Material</li> <li>- Caltrans 72-2.03 Rock Slope Protection, Placement</li> <li>- <u>Health and Safety Standards:</u> (1). Injury and Illness Prevention Program (IIPP): Conforming to the General Industrial Safety Orders (CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 3203), and the California Labor Code (Section 6401.7). (2). Site-Specific Safety and Health Plan (SSHP): Describing health and safety procedures that shall be implemented during the Work in order to ensure safety of the public and those performing the Work. Follow the guidelines for a SSHP listed in CCR Title 8, Division 1, Chapter 4, Subchapter 7, Section 5192, Item (b)(4) f., (3) Fire Protection Plan</li> <li>- Comply with CCR Title 8, Division 1, Chapter 4, subchapter 4 (Construction Safety Orders), Section 1541.1</li> </ul> </li> </ul>
If project is part of a multi-phased project complex, describe how the project can operate as a stand-alone project.	<p>The proposed project was designed to be implemented in stand-alone phases.</p> <p>Phase 1 Proposition 84 Round 1 Implementation funds: The Project will 1) enhance 21 acres of riparian habitat along 9,400 linear feet of Copeland Creek by strategically removing 10 acres of invasive species and replanting with 14,650 plants; 2) remove up to 11,000 cubic yards of sediment to foster the Creek's natural geomorphic functioning, mitigate flooding, and improve fish passage and water quality; and 3) complete the 30, 60, &amp; 90% design and environmental documents for up to three stormwater detention basins.</p> <p>Phase 2: Proposition 1E funds are needed to 1) finalize the stormwater detention basins design and environmental document (EIR); 2) enhance and restore riparian habitat along 6,600 linear feet of Copeland Creek; 3) increase open space preserved by 75 to 90 acres including the headwaters of Hinebaugh Creek; and 4) construct more than 6,600 linear feet of public trails</p>

GENERAL INFORMATION: Project Name	
	<p>and bike paths along the Copeland Creek corridor from Sonoma State University east to Crane Creek Regional Park, and rehabilitate 6,000 linear feet of pedestrian and bike trails from SSU west toward Highway 101 to provide a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.</p> <p>Simultaneously with the stormwater detention basins design and environmental documents finalization, the project team will implement habitat restoration and trail rehabilitation. The project benefits are cumulative through each of the two phases and none of the phases is incomplete or adversely impacted by the others.</p>

The Sonoma County Water Agency in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the City of Rohnert Park, Sonoma State University (SSU), the Conservation Corps North Bay and the University District, LLC proposes to implement a regionally integrated project in the Copeland Creek Watershed between Highway 101 at Rohnert Park east to Crane Creek Regional Park. This public-private partnership intends to accomplish the following objectives:

- Stormwater detention of up to 200 acre-feet in up to three off-stream basins located in the alluvial fan east of Petaluma Hill Road that will provide regional flood protection and 150 acre-feet or more annual groundwater recharge potential.
- Riparian habitat restoration along up to 16,000 linear feet of Copeland Creek.
- Removal of up to 11,000 cubic yards of sediment and re-contouring of up to 2 miles of channel bottom, and construction of sediment collection basins to detain fine sediment from roads, erosion, and other upland sources that otherwise would be deposited onto the streambed.
- Provision of off-channel refuge in the mid-reach of Copeland Creek to protect listed juvenile steelhead against high flow events.
- Protection of water quality for salmonids.
- Increase of 75 to 90 acres of permanent preserved open space.
- Construction of more than 6,000 linear feet of public trails and bike paths along Copeland Creek from SSU east to Crane Creek Regional Park, and west toward Highway 101 to provide a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.

The project will improve flood protection, reduce sediment deposition downstream, recharge groundwater, improve groundwater supply reliability, improve salmonid habitat, provide salmonid refugia off-stream, conserve energy resulting from reduced pumping, and create a site for public access and education about hydrology, fish, and watershed geomorphic processes.

**Proposition 1E Funded Project Elements (See attached Project Elements Table for additional information).**

Specific Goals and Objectives of the Project Table		
	Goal	Measurable Objectives for each Goal
1.	Provide adequate flood protection and channel conveyance capacity and conserve and enhance native salmonid populations by protecting and restoring required habitats, water quality, and watershed processes	<ul style="list-style-type: none"> <li>• Prepare 90% to final design and environmental documents and complete construction of up to three off-stream detention basins with a total capacity of up to 200 acre-feet and up to 150 acre-feet of annual groundwater recharge potential located in the alluvial fan east of Petaluma Hill Road that will provide regional flood protection and storm water detention.</li> <li>• Removal of non-native invasive shrubs and trees and replanting with up to 2,700 plants to enhance and restore 10 acres of riparian habitat along up to 6,600 linear feet of Copeland Creek</li> </ul>
2.	Provide an ongoing, inclusive framework for efficient intra-regional cooperation, planning and project implementation	The Sonoma County Water Agency will work in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the County of Sonoma, the City of Rohnert Park, Sonoma State University, the Conservation Corps North Bay and the University District, LLC to implement a regionally integrated project in the

Specific Goals and Objectives of the Project Table		
	Goal	Measurable Objectives for each Goal
		<p>Copeland Creek Watershed that will include a collaborative process, sharing technical expertise, costs, and work products, monthly conference calls, quarterly meetings, and submission of design and environmental documents at key milestones for review and comment.</p> <p>Provide 1) education (hydrology, the water cycle, fish habitat, and geomorphic processes in the upper watershed) and 2) career building opportunities using focused Youth Providers to involve schools in education and youth groups in assisting with the work (e.g. Conservation Corps North Bay (CCNB), SCAYD-Sonoma County Adult Youth Development, The Center for Social and Environmental Stewardship).</p>
3.	Implement energy independence, greenhouse gas emissions or climate change adaptation project elements	The project will include conserving energy resulting from reduced dependence on pumping and importation of potable surface water. If the City of Rohnert Park were to have to import an equivalent amount of additional water, the resulting greenhouse gas emissions would be approximately 200 tons CO2 per year. Gravity fed infiltration strategies are the most energy efficient means of recharging groundwater basins. Maintaining groundwater at higher levels also reduces pumping costs.
4.	Ensure adequate water supply while minimizing environmental impacts	The project will include enhancing groundwater supply reliability with up to 150 acre-feet annual groundwater recharge potential which will decrease dependence on imported Russian River water and potentially result in reduced pumping and importation of potable surface water.
5.	Acquisition, protection, and restoration of open space and watershed lands and enhancement of watershed educational and recreational opportunities	The project will include 1) construction of more than 6,000 linear feet of public trails from Sonoma State University east to Crane Creek Regional Park, and 6,000 linear feet of public bike paths from Sonoma State University west toward Highway 101 to enhance recreational opportunities, provide alternate commute options for pedestrians and cyclists, and increase the quantity and quality of biking and hiking opportunities and create a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park; and 2) Acquire, protect, and restore 75 to 90 acres of permanent preserved open space, including the upstream portion of Hinebaugh Creek and Copeland Creek

Description of the Purpose and Need of the Project
<p>The proposed project includes construction of storm water detention basins sited to capture runoff from the Copeland Creek headwaters which would reduce the impacts of future 100 year floods upon the regional downstream properties and structures. The regional and local impacts of a 100 year flood have been determined to affect at least one – quarter of the downstream City of Rohnert Park including Sonoma State University, Rancho Cotati High School, businesses, residences, and adjoining City arterial roadways, such as Rohnert Park Expressway and Snyder Lane.</p> <p>Historical groundwater level declines in the region have been a concern to many groundwater users in the area. The storm water detention/groundwater recharge basins would be located over one of the few areas within the southern Santa Rosa Plain groundwater basin ranked as having a high potential for groundwater recharge, making it ideal in its potential to enhance the replenishment of local groundwater supplies.</p>

### **Description of the Purpose and Need of the Project**

The Project also would restore degraded portions of Copeland Creek, thereby improving downstream water quality and riparian habitat. Copeland Creek is an important migratory corridor for fish that pass through the engineered Copeland Creek reaches toward upstream spawning sites. The proposed project will provide habitat enhancement and restoration, while the Phase I Proposition 84 IRWMP Funded Project will remove sediment, re-contour up to 2 miles of channel bottom, and construct sediment collection basins to detain fine sediment from roads, erosion, and other upland sources that otherwise would be deposited onto the streambed. The sediment elements of the project will foster the Creek's natural geomorphic functioning, mitigate flooding, and improve fish passage and water quality; which will reduce nutrients and pollutants entering the channel, improve surface water quality, improve the quantity and quality of habitat available for native wildlife, improve stream conditions to support fisheries, and improve storm water management. Implementation will include the use of Conservation Corps Crews and a public outreach and education component.

### **Project Description**

The Sonoma County Water Agency in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the City of Rohnert Park, Sonoma State University, Conservation Corps North Bay and the University District, LLC proposes to implement a regionally integrated project in the Copeland Creek Watershed between Highway 101 at Rohnert Park, east approximately 3 miles to Crane Creek Regional Park. This public-private partnership intends to implement the Project in two phases.

Phase 1 Proposition 84 Round 1 Implementation funds: The Project will 1) enhance 21 acres of riparian habitat along 9,400 linear feet of Copeland Creek by strategically removing 10 acres of invasive species and replanting with 14,650 plants; 2) remove up to 11,000 cubic yards of sediment to foster the Creek's natural geomorphic functioning, mitigate flooding, and improve fish passage and water quality; and 3) complete the 90% design and environmental documents for up to three stormwater detention basins.

Phase 2: Proposition 1E funds are needed to 1) finalize the stormwater detention basins design and environmental document (EIR); 2) enhance and restore riparian habitat along 6,600 linear feet of Copeland Creek; 3) increase open space preserved by 75 to 90 acres including the headwaters of Hinebaugh Creek; and 4) construct more than 6,600 linear feet of public trails and bike paths along the Copeland Creek corridor from Sonoma State University east to Crane Creek Regional Park and rehabilitation of 6,000 linear feet of pedestrian and bike trails from SSU west toward Highway 101 to provide a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.

The main stem of Copeland Creek is 9.1 miles in length. The Copeland Creek watershed is 5.1 square miles, with about 3.9 square miles of that area upstream of the proposed detention basins. The Copeland Creek watershed can be characterized by three zones largely dictated by topography, the steep cobble dominated upper headwaters, the moderately steep alluvial fan, and the flood control channel through urban areas below Petaluma Hill Road. The Copeland Creek headwaters provide the source for flood waters, runoff, groundwater recharge, and sediment yields transported downstream.

The regional and local impacts of a 100 year flood have been determined to affect at least one – quarter of the downstream City of Rohnert Park including Sonoma State University, Rancho Cotati High School, businesses, residences, and adjoining City arterial roadways, such as Rohnert Park Expressway and Snyder Lane. Storm water detention basins sited to capture runoff from the Copeland Creek headwaters would reduce the impacts of future 100 year floods upon the regional downstream properties and structures.

Historical groundwater level declines in the region have been a concern to many groundwater users in the area. The storm water detention/groundwater recharge basins would be located over one of the few areas within the southern Santa Rosa Plain groundwater basin ranked as having a high potential for groundwater recharge, making it ideal in its potential to enhance the replenishment of local groundwater supplies.

The Project would also restore degraded portions of Copeland Creek, thereby improving downstream water quality, restoring riparian habitat, and providing an important migratory corridor for fish that pass through the engineered Copeland Creek reaches toward upstream spawning sites.

## Project Description

When completed, the project will improve flood protection, reduce sediment deposition downstream, recharge groundwater, improve salmonid habitat, provide salmonid refugia off-stream, conserve energy resulting from reduced pumping and importation of potable surface water, and create a site for public access and education about the hydrology, the water cycle, fish habitat, and geomorphic processes in the upper watershed.

## Proposition 1E Funded Project Elements

### *Scientific and Technical Merit Discussion: Rationale for the Project*

#### **Storm Water Detention/Recharge Basin Design**

##### Hydrology and Hydraulics

Based on the geographic size of its upstream watershed, Copeland Creek - through the City of Rohnert Park - is categorized as a "major waterway" in accordance with the Sonoma County Water Agency's Flood Control Design Criteria. Consequently, standards require that flood control improvements be designed to provide sufficient capacity to protect against flooding for the 1% probability of exceedance storm event (100 year storm).

In recent years, the hydrologic and hydraulic characteristics of Copeland Creek have been analyzed multiple times in association with regional/city-wide drainage studies for the City of Cotati (2002) and the City of Rohnert Park (2006), as well as more current (2010) analyses associated with the University District Specific Plan in Rohnert Park. The studies have utilized a couple of different hydrologic methods to evaluate this watershed that is within a Mediterranean type climate (SCS Type 1A storm) with a Mean Annual Precipitation ranging from 30" in the valley floor to 45" at the headwaters. Both the SCS Unit Hydrograph Method with Muskingum-Cunge flood routing procedure and the SCWA Modified Rational Method have been utilized for developing estimates of runoff generation and peak stream flows. The most current evaluation utilizes HEC-HMS to model the hydrology. All three studies have utilized HEC-RAS to model the hydraulic conditions and simulate water surface profiles within Copeland Creek. The current analysis utilizes unsteady flow HEC-RAS to model existing break-out flow conditions along Copeland Creek and estimate the required volume of detention basin storage required to provide the necessary 100-year event flood protection capacity.

Break-out flows estimated at over 650 cfs for the 100-yr design event contribute to urban flooding within the Copeland Creek watershed and the adjacent Hinebaugh Creek watershed. At the conceptual design stage of the detention basins, approximately 150 AF or more of storage had been determined to be necessary to contain 100-yr flows within the Copeland Creek channel. The design will build upon the prior hydrologic and hydraulic analysis to identify the precise storage volume required. The final geometric design of the basins will be configured to optimize hydraulic performance, facilitate groundwater recharge and sediment capture, provide the desired refugia benefits, and accommodate the adjacent habitat restoration and trail construction elements of the overall project.

Monitoring approaches for assessing effectiveness of the basins for flood hazard reduction will include: (1) monitoring of stream flows utilizing an existing USGS flow gauge located along the project reach of Copeland Creek; (2) monitoring of stream and basin stage gauges to be installed as part of the project; and (3) utilizing project construction and monitored gauge data to enhance the development and calibrated accuracy of an existing HEC-RAS model for Copeland Creek to validate project performance (and enhance predictive capabilities of the model).

The stormwater detention basins may also capture sediment upstream in Copeland Creek and cause a reduction in sediment loads to the Laguna de Santa Rosa downstream. Capturing the sediment upstream will not only decrease sedimentation downstream but will also increase hydraulic storage capacity, improve water quality, and improve habitat in the lower reaches of Copeland Creek and upper Laguna De Santa Rosa Flood Control Channel. Sedimentation has been reducing the attenuating capacity of the Laguna De Santa Rosa considerably and

## ***Scientific and Technical Merit Discussion: Rationale for the Project***

aggravating flooding.

### **Hydrogeology**

The Project is located over the alluvial fan reach of Copeland Creek, which is characterized by relatively moderate slopes and permeable sand and gravel deposits (California Geologic Survey, 2003). Particle size analysis indicates that Copeland Creek contains the coarsest material and greatest percentage of gravel in comparison with other tributaries of the Laguna de Santa Rosa (Laurel Marcus & Associates, 2004). Consistent with these characteristics, mapping of groundwater recharge areas indicates the Project is located over one of the few areas within the southern Santa Rosa Plain groundwater basin ranked as having a high potential for groundwater recharge (Winzler & Kelly, 2005).

As shown in the attached ***Todd Engineers Figure 16 - 1951 USGS Water Contour Levels***, groundwater-level contours reflecting 1950 groundwater levels (prior to increases in local groundwater pumping) reveal a series of convex contours that reflect groundwater recharge in the Copeland Creek watershed and the radial outflow of groundwater underneath the Copeland Creek alluvial fan (Todd Engineers, 2004). This groundwater flow pattern further indicates the importance of recharge from the Copeland Creek alluvial fan to the groundwater basin. More recently, groundwater levels in the vicinity of the project area exhibited pronounced declining trends between the early 1970s and 1990s, as groundwater pumping increased in the area. Such declining trends have been most prominent in intermediate or deeper zone aquifers (e.g., observed in wells that are greater than 100 feet deep). Groundwater levels in many wells near the project area began to recover in approximately 2003, as municipal groundwater pumping was reduced, as shown in the attached ***Todd Engineers Figure 14 Selected Hydrographs***. However, groundwater-levels in many wells in the area remain below historical (i.e., 1950) groundwater levels indicating that the intermediate and deeper zone aquifers can benefit from additional groundwater recharge.

Site-specific investigations at the Project site, which included the excavation and logging of eighteen test pits and the installation and gauging of 6 piezometers, indicate that subsurface materials are also predominantly coarse grained (e.g., clayey sands and gravels) and that shallow-zone groundwater levels range from 3 to 7 feet below ground surface in the winter and spring to 7 to 19 feet below ground surface in the late summer and fall (Engeo, 2005 and Winzler & Kelly, 2007). These observed shallow groundwater levels are likely associated with a perched aquifer zone in the project area. Available hydrogeologic data for the project area indicate that the alluvial fan deposits extend to depths ranging from approximately 100 to 200 feet and are underlain by volcanic rocks and sediments of the Sonoma Volcanics (CH2M Hill, 2007). The transmissivity of the shallow alluvium was estimated to be approximately 20 feet per day (ft<sup>2</sup>/day) (Engeo, 2005). Transmissivities for intermediate and deeper zone aquifers in the area were estimated to range from 160 to 1,600 ft<sup>2</sup>/day, with transmissivity values increasing toward the west correlating with an increasing thickness of the alluvial aquifers (CH2MHill, 2007). Groundwater modeling performed by CH2MHill (2007) as part of an investigation for siting potential recycled water storage ponds on and in the vicinity of the project site indicates that shallow groundwater levels may limit the ability of the proposed retention ponds to recharge the intermediate and deeper aquifer zones. Further investigation of the presence and depth of any perched layer will be performed through geotechnical investigations proposed at the project site.

Such geotechnical investigations will include the construction and monitoring of four shallow streambank piezometers (planned to range in depth from 3 to 10 feet) along Copeland Creek and three groundwater monitoring wells (planned to range in depth from 50 to 100 feet). During drilling of the proposed groundwater monitoring wells, detailed lithologic information will be gathered to further assess the depth, lateral continuity and thickness of any shallow perched aquifer layers.

Monitoring approaches for assessing groundwater recharge as part of the project will include: (1) monitoring of groundwater levels and temperature from shallow streambank piezometers to be constructed in the project area; (2) monitoring of groundwater levels and temperature from monitoring wells to be constructed at the project site;



### ***Scientific and Technical Merit Discussion: Rationale for the Project***

(3) evaluation of publicly available groundwater-level data collected and reported for nearby water wells; and (4) estimating the amount of groundwater recharge using a fully coupled surface water/groundwater flow model under development by the U.S. Geological Survey for the Santa Rosa Plain Groundwater Basin.

#### **Habitat Enhancement/Restoration**

##### Location

Copeland creek is significant locally as one of the few urban streams that still supports threatened steelhead. Copeland Creek serves primarily as a migration corridor for steelhead, although sections of this creek do provide habitat for a wide range of native fish species such as California roach, threespine stickleback, and riffle sculpin. Copeland Creek is upstream of the Laguna De Santa Rosa which is one of the largest freshwater wetlands in Northern California, and provides 80,000 acre feet of flood attenuation on the Russian River.

##### Rationale and Feasibility

The Sonoma County Water Agency began a restoration project in the Project Area in 1999 using internal Fisheries Enhancement Project funds (Copeland Creek Restoration Project Monitoring Plan, Sonoma County Water Agency, 2001). This effort involved attempts to reestablish the riparian corridor and monitor the results by conducting vegetation cover sampling, bird counts, monitoring ground water levels, and aquatic habitat typing. The depth to summer groundwater was determined to be the limiting factor dictating success of the riparian plantings. Restoration plans will account for this parameter, and utilize appropriate techniques to insure better planting survival (utilize large pole cuttings of deep rooted riparian flood plan species such as Fremont poplar, as well as red and pacific willow).

Fisheries habitat assessments, fish counts and fish rescue activities conducted by the Sonoma County Water Agency since 2000 indicate that greater complexity and improved passage conditions through the reaches could increase the frequency and duration of pool habitat, leading to improved conditions for both salmonids and native minnows.

Copeland Creek within the Proposed Project Area serves primarily as a migration corridor for steelhead, although sections of this creek do provide habitat for a wide range of native fish species such as California roach, threespine stickleback, and riffle sculpin. In general, the Sonoma County Water Agency fish surveys along this channel have shown that significant stretches between Stony Point Road and Highway 101 often go dry during critical summer periods. The existing trapezoidal channel provides little in the way of habitat complexity, and opportunities for scour pools to form are rare. This is highlighted by the fact that the few juvenile steelhead that have been captured in lower Copeland Creek have been associated with these limited pools. In areas where pools have formed and perennial surface water exists, our data indicate that a 100 meter representative (similar size, topography, vegetation) stream segment supports between 100-1,000 individuals of largely native species.

##### Methodology

Restoration techniques that would be utilized for this Project are described in the Sonoma County Water Agency's Stream Maintenance Manual (SMP), (Sonoma County Water Agency, 2009). This document builds on and borrows concepts from typical sources of conventional wisdom regarding restoration and enhancement of riparian habitats including California Salmonid Stream Habitat Restoration Manual, 1998 3rd edition, and the California Riparian Habitat Restoration Handbook, Riparian Habitat Joint Venture, 2008. Chapter 7 describes built-in best management practices (BMPs) that reduce impacts associated with vegetation maintenance, bank stabilization and sediment removal and includes many special-status species specific requirements. Chapter 8 identifies methods used by the SMP to mitigate for program impacts. Appendix E of the SMP provides a useful discussion of the over arching and underlying guiding principles used by the SMP during implementation of vegetation maintenance.

The SMP manual provides a reasonably detailed approach to conducting riparian restoration and enhancement in the Sonoma County Water Agency flood control channels. In practice, restoration is individually tailored to each

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restoration site based on the characteristics that affect plant selection and placement (location in the watershed, existing site vegetation, vegetation upstream and downstream, instream conditions, dimensions, and other geomorphic characteristics). Largely this is accomplished using experienced staff familiar with the natural history and micro and macro-ecology of local native riparian and upland plant species to utilize existing and new planting locations to maximize diversity, canopy structure, and beneficial interactions of the installed material with high flows. Useful taxonomic and ecological references for this region include Terrestrial Vegetation of California (UC, 1988), Jepson Manual (Hickman, 1993), Flora of North America, (Flora of North America Committee, 1993+), Flora of Sonoma County (Best, Howell, Knight 1996), California Vegetation (Holland 1995), and Enhancing and Caring for the Laguna (Laguna De Santa Rosa Foundation, 2006).

#### **Program Monitoring**

The Sonoma County Water Agency would propose conducting some validation monitoring to track changes in instream habitat, fisheries use, wildlife (avian) use, as well as tracking changes in invertebrate populations. Many of the methods the Sonoma County Water Agency proposes to use are detailed in Copeland Creek Restoration Project Monitoring Plan (Sonoma County Water Agency, 2001).

Specifically for this Project, the Sonoma County Water Agency proposes to conduct fish sampling and habitat assessment following methodologies detailed in California Salmonid Stream Habitat Restoration Manual. Avian use will be assessed following Point Reyes Bird Observatory (PRBO) methodologies. The Sonoma County Water Agency proposes to measure canopy development as a primary indicator of Project success by collecting line intersect cover data at established and representative locations along the project site. To monitor water temperature, the Sonoma County Water Agency will install temperature sensors (Hobos) and compare the results to historic Hobo data collected along the reach to evaluate temperature conditions following implementation of habitat restoration. The Sonoma County Water Agency proposes conducting some validation monitoring to track changes in instream habitat as well as tracking changes in invertebrate populations. See Figure 2 for the approximate number and locations of proposed environmental monitoring.

Some aspects of the water quality element of the project could be calculated from measured pollutant loads in the system from nearby streets. The future Phase 2 Municipal Storm Water (MS4) Permit is anticipated to require additional water quality monitoring. Consequently, the City of Rohnert Park may begin collecting such water quality data under a new permit. In the event that this monitoring does occur, we will use the monitoring data to try to correlate changes in water quality with riparian enhancement/restoration.

#### **Proposition 84 IRWMP Round 1 Funded Project Element Sediment Removal**

Copeland Creek is a depositional stream. The Sonoma County Water Agency has been required over the past ten years to conduct three large reach scale sediment removal projects to maintain hydraulic capacity. The straight trapezoidal shape and predominance of cattail in the bottoms and Himalayan blackberry along the edges encourages even greater rates of sedimentation. The proposed project provides an approach to establish a sustainable riparian corridor and instream environment where sediment removal is not needed at a large reach scale. This would be a major benefit to salmonid use of the area (largely migratory but with habitat enhancements possibly rearing opportunities), benefit the existing warmwater fisheries, establish more complex habitat for native wildlife, and provide recreational opportunities for walkers to observe, enjoy and learn from the riparian habitat.

The Sonoma County Water Agency anticipates that conducting strategic sediment removal and installation of a “bankful” thalweg will improve the complexity of the existing fish habitat extensively and improve pool frequency through this reach. With improved pool habitat we would anticipate that the habitat could support similar numbers of fish. Besides the improvement to native minnows, the proposed project would improve upstream and

### ***Scientific and Technical Merit Discussion: Rationale for the Project***

downstream migration conditions for steelhead and if pools with sufficient depth and duration are established, possibly instream rearing habitat.

The Sonoma County Water Agency will also re-configure the bottom of the stream channel through strategic sediment removal to create appropriately sized (bank-full) low-flow thalwegs, and install instream focused sediment collection areas. Installation of focused instream sediment basins in Copeland Creek will prevent sediment from reaching the Laguna De Santa Rosa, help address the TMDL's and alleviate flooding in the Rohnert Park Cotati area. These features are defined and highlighted in the Sonoma County Water Agency's Stream Maintenance Manual (SMP), (the Sonoma County Water Agency, 2009) as the best approach to manage sediment and delay needed maintenance to allow habitat development. This approach has been implemented for the Sonoma County Water Agency sediment removal and re-vegetation efforts since 2008 and observed to restore some geomorphic function to straightened and depositional flood control channels. A useful reference for the function and utility of this channel arrangement is described in detail in Fischenich, C. (2002). "Design of low-flow channels," *EMRRP Technical Notes Collection* (TN EMRRP-SR-19), U.S. Army Engineer Research and Development Center, Vicksburg, MS. [www.wes.army.mil/el/emrrp](http://www.wes.army.mil/el/emrrp).

The Sonoma County Water Agency currently holds the permits needed for sediment removal, vegetation management and restoration enhancement and is ready to proceed with implementation upon grant agreement approval and execution. Additionally, the Sonoma County Water Agency maintains the technical expertise (fisheries, botany, ecology, geomorphology, public information, engineering, and resource planning) on staff to effectively implement the project and conduct outreach and monitoring, as well as prepare any needed environmental documents.

### ***Scientific and Technical Documentation Table***

<b>Technical Document Name</b>  <b><i>Format:</i></b> <b><i>Author/Agency. Title, Sub-title*, Client</i></b> <b><i>*, Completion Date.</i></b> <b><i>* if applicable</i></b>	<b><i>Relevant page numbers</i></b>	<b>Digital file name on CD</b>
Brown, T.C. 2007. "The Marginal Economic Value of Streamflow from National Forests: Evidence from Western Water Markets." In: M. Furniss, C. Clifton, and K. Ronnenberg, eds. Advancing the Fundamental Sciences: Proceedings of the Forest Service National Earth Sciences Conference, San Diego, CA, October 2004. Gen. Tech. Rep. PNW-GTR-689. Portland, OR: U.S. Forest Service, Pacific Northwest Research Station.	p. 458-466	Brown_Value_2007.pdf

### Scientific and Technical Documentation Table

Clahan, K.B., Bezore, S.P., et. al., Geologic map of the Cotati 7.5' quadrangle, Sonoma County, California: A digital database: California Geological Survey website, <a href="http://www.consrv.ca.gov/CGS/rghm/rgm/prliminary_geologic_maps.htm">http://www.consrv.ca.gov/CGS/rghm/rgm/prliminary_geologic_maps.htm</a> , 2003	1 page	CA_Geological_Survey_Cotati_7.5_Quadrangle_2003.pdf
ENGEO. Geotechnical Exploration, Anderson 128 Property Recycled Water Ponds, Rohnert Park, California. Submitted to University District LLC, September 2005.	1-17 Geotechnical Study and Design Concepts	Engeo_Geotech_2005.pdf
Fischenich, C. Design of Low-Flow Channels, U.S. Army Corps of Engineers, August 2002	1-9	Fischenich_USACE_Low_Flow_Channels_2002.pdf
Griggs, F. T. California Riparian Habitat Restoration Handbook, September 2008.	22-28	Griggs_Restoration_Handbook_2008.pdf
Laguna De Santa Rosa Foundation. Enhancing and Caring for the Laguna De Santa Rosa, 2006.	189, 246, 477	Laguna_De_Santa_Rosa_Enhancing_Laguna_2006.pdf
Laurel Marcus & Associates. Copeland Creek Watershed Assessment, Sotoyome Resource Conservation District, October 2004.	60	LMA_Copeland_Creek_Watershed_Assessment_2004.pdf
Riley, A. L. Putting a Price on Riparian Corridors as Water Treatment Facilities, San Francisco Bay Regional Water Quality Control Board, 2008.	1-16	Riley_SFRWQCB_Price_Riparian_Corridors_2008.pdf
Sonoma County Water Agency, Copeland Creek Restoration Monitoring Plan, 2001.	1-16	Copeland_Restoration_Monitoring_2001.pdf
Sonoma County Water Agency, Copeland Project Plan Figure 1, December 2010.	Figure 1	SCWA_Copeland_Project_Plan_Figure_1_2010.pdf
Sonoma County Water Agency Copeland Project Plan Figure 2, Proposed Environmental Monitoring, December 2010.	Figure 2	SCWA_Copeland_Project_Plan_Env_Monitoring_Figure_2_2010.pdf
Sonoma County Water Agency, Stream Maintenance Program, January 2009.	<u>1</u> -1 thru 18; <u>2</u> -34 thru 36, <u>3</u> -3 thru 5, 13,57; <u>4</u> -10, 14 thru 16; <u>5</u> -8 thru 15; <u>6</u> -3 thru 10; <u>8</u> -	Sonoma_County_Water_Agency_SMP_2009.pdf

### Scientific and Technical Documentation Table

	23 thru 26; Tables 7.1 & 7.2; Figures 3-14, 3-15, 4-40	
Todd Engineers. Figure 14 Selected Hydrographs, June 2004.	1 of 1	Todd_Hydrographs_2004.pdf
Todd Engineers Figure 16 Water Level Contour Map 1951 - USGS Water Supply Paper 1427, Plate 2 (Cardwell, 1958), June 2004	1 of 1	Todd_Water_Level_Contours_2004.pdf
Winzler & Kelly. Technical Memorandum, IRWP Seasonal Storage Project, Groundwater Evaluation, City of Santa Rosa, November 2007.	5; Figs 30-36; Attachment page 3-2 and Attachment 3 Figs 3-9 to 3-12	Winzler_Kelly_Tech_Memo_IRWP_Storage_2007.pdf
Winzler & Kelly. Technical Memorandum – Phase IV, Alternatives Analysis and CIP, Storm Water System Model Study, City of Rohnert Park, November 2006, Revised May 2009.	1-10	Winzler_Kelly_Tech_Memo_IV_2009.pdf
Winzler & Kelly. Technical Memorandum – Data Review and Design Criteria, Draft Storm Water System Model Study - Phase II, City of Rohnert Park, April 15, 2011	1-6	Winzler_Kelly_Tech_Memo_II_2011.pdf
Winzler & Kelly. Groundwater Recharge Map, City of Rohnert Park Final Water Supply Assessment, January 2005.	1 page	Winzler_Kelly_Groundwater_Recharge_Map_2005.pdf

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
A	<b>Proposition 84 Implementation Round 1 Funding and Sonoma County Water Agency Match to those funds are leveraged funds and are <i>not</i> counted toward the Proposition 1E match; Caltrans Environmental Enhancement and Mitigation (EEMP) Funds and Sonoma County Water Agency Match to those funds are leveraged funds and are <i>not</i> counted toward the match.</b>						
A.1	Habitat Restoration	From Commerce Boulevard near Highway 101 to Joyce Court in Rohnert Park - Enhancement and restoration of 21 acres of riparian habitat along 9,400 linear feet of Copeland Creek by strategically removing 10 acres of invasive species and replanting with approximately 1300 upland trees, 1620 riparian trees, 3,360 upland shrubs, 3,360 riparian shrubs, 3,360 upland grasses, and 3,360 instream graminoids to stabilize creek banks and reduce sedimentation in areas at risk of erosion.	Stream Program Draft EIR (Complete) Stream Program Final EIR (Complete) Permits (Complete) Design (85% Complete) Photo Documentation	NA	7/1/2011	6/30/2014	25%
A.2	Sediment Removal	Removal of up to 11,000 cubic yards of accumulated sediment and re-contouring of up to 2 miles of channel bottom from the flood control channel, including construction of up to 3 in-stream sediment collection basins	Notice of Preparation Amended Draft EIR Final Amended EIR Permits Design	NA	7/1/2011	6/30/2014	50%
A.3	30,60,90% Design/CEQA for SW Detention Basins	Storm water detention of up to 200 acre-feet in two to three off-stream basins located in the alluvial fan east of Petaluma Hill Road yielding 150 acre-feet or more annual groundwater recharge potential, and improving groundwater supply reliability. A certified CEQA EIR exists for the	Earthwork Calculations Geotechnical Study Hydraulic Calculations Draft Construction Cost Estimate 30, 60, 90% design and specifications	NA	7/1/2011	3/29/2013	Conceptual Design; certified CEQA EIR

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		<p>proposed site locations for the storm water detention basis. Because the storm water detention basins were not included in the CEQA project description, additional CEQA documentation is required.</p> <ol style="list-style-type: none"> <li>1. Select qualified consultant to continue to advance the CEQA documentation process through a qualification based selection process</li> <li>2. Determine Lead Agency</li> <li>3. Conduct preliminary project review</li> <li>4. Commence preparation of Initial Study per CEQA Guidelines Section 15063.</li> </ol>					
<b>B</b>	<b>Match Funded Project Elements</b>						
	<b>Federal Transportation Enhancement Grant</b>						
<b>B.1</b>	Habitat Restoration	From Sonoma State University West toward Highway 101: Removal of non-native vegetation between the reconstructed/new path segments and Copeland Creek; planting of native vegetation where re-landscaping is needed along the reconstructed and new path segments.	<p>Stream Program Draft EIR (Complete)</p> <p>Stream Program Final EIR (Complete)</p> <p>NEPA Document – in progress</p> <p>Permits (Complete)</p> <p>Design (85% Complete)</p> <p>Photo Documentation</p>	NA	6/1/2011	10/31/2012	25%
<b>B.2</b>	Trail Development	Reconstruction of approximately 3900 LF of existing deteriorated Class I bicycle/pedestrian path along Copeland Creek	<p>NEPA Document</p> <p>Permits</p> <p>Design</p> <p>Photo Documentation</p>	NA	6/1/2011	10/31/2012	25%
<b>Sonoma County Agricultural Preservation and Open Space District (SCAPOS) Match Funds</b>							
<b>B.3</b>	Phase 1-3 Trails/Bike Paths	Construct more than 6,000 linear	Draft EIR	NA	9/1/2011	9/30/2014	10%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		feet of public trails from Sonoma State University east to Crane Creek Regional Park, and rehabilitate 6,000 linear feet of public bike paths from Sonoma State University west toward Highway 101 to expand regional parks, enhance recreational opportunities, and provide alternate commute options for pedestrians and cyclists and a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.	Final EIR Permits Design Photo Documentation				
<b>PROPOSITION 1E SWFM ROUND 1 PROJECT ELEMENTS AND TASKS</b>							
<b>1.0</b>	<b>Project Management</b>						
1.1	Contract Management/Finance Development  Note: See Task 3.6/3.7 for Labor Compliance	<ol style="list-style-type: none"> <li>1. Arrange and participate in project coordination and progress meetings and conference calls with project partners.</li> <li>2. Prepare and track budget, expenses, and schedule.</li> <li>3. Coordinate and participate in meetings and conference calls</li> <li>4. Prepare invoices and backup documentation.</li> <li>5. Review and track compliance with DWR contract requirements.</li> <li>6. Prepare Requests for Proposals (RFPs), bidding documents, and construction documents, and procure consultants and contractors.</li> <li>7. Award and administer contracts with consultants and contractors including reviewing and tracking scope, schedule and budget, and compliance with contract terms.</li> </ol>	-RFPs - Consulting Agreements - Contract documents	N/A	9/2011	12/2011	0%
1.2	Project Performance Plan	In cooperation with DWR and other	Performance Monitoring Plan –	N/A	9/2011	2/2012	0%



#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
	Development – Data Management and Monitoring	<p>appropriate agencies, develop a performance monitoring/data management and monitoring plan consistent with IRWM Guidelines. The plan that will address, at a minimum, the following elements:</p> <ol style="list-style-type: none"> <li>1. Identify project performance goals</li> <li>2. Define performance indicators for each goal Identify the method, frequency, and schedule for collection of monitoring data</li> <li>3. Identify the party responsible for the collection of data and data management</li> <li>4. Prepare a Draft Monitoring Plan</li> <li>5. Provide a copy to participating agencies</li> <li>6. Revise Monitoring Plan as per agency recommendations</li> <li>7. Prepare Final Monitoring Plan</li> </ol>	Data Management and Monitoring				
1.3	Quarterly Reports	<p>Reports will be submitted quarterly from September 2011 through completion date. The progress reports will describe activities undertaken and accomplishments of each task during the quarter, milestones achieved, and any problems encountered in the performance of the work under the agreement.</p> <p>The description of activities and accomplishments of each task during the quarter will provide a basis for payment of invoices and percent of task work completed for the purpose of calculating invoice amounts.</p> <ol style="list-style-type: none"> <li>1. Prepare progress reports every three months in accordance with DWR reporting format</li> </ol>	Quarterly Reports- submitted every 3 months until completion	1.1	9/2011	12/2015	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		2. Describe project progress, such as activities completed and problems encountered in current quarter 3. Provide percent complete status for all project tasks					
1.4	Final Report	A draft will be provided 60 days before the end of Grant Agreement. Comment period on draft will be 30 days and Final Report will incorporate comments to the extent possible or provide explanation to comment source. The report shall include the following narrative sections: An introduction section including a statement of purpose, the scope of the project, and a description of the approach and techniques used during the project. A list of the task deliverables. Determination of whether the purpose of the project has been met. Information collected in accordance with the project monitoring and reporting ("assessment and evaluation") plan. 1. Track project activities, including photo monitoring 2. Summarize project activities, achievements and difficulties 3. Prepare Draft Project Report and include DWR report content requirements 4. Provide Draft report to appropriate agencies for review and comment 5. Prepare Final Project Report	Draft Report Milestone: Final Report	Construction Completion 3.6; 4.3	7/2015	12/2015	0%
<b>2.0</b>	<b>Habitat Restoration SSU to 1 mile east of Petaluma Hill Road</b>						
NA	CEQA Development – habitat enhancement and	The Sonoma County Water Agency has completed CEQA for Copeland	Draft EIR (Complete) Final EIR (Complete)	N/A	N/A	N/A	100%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
	restoration	Creek habitat restoration and enhancement.	Milestone: Notice of Determination				
NA	NEPA Development	NEPA is not required for the Project	N/A	N/A	N/A	N/A	N/A
NA	Design – Habitat Enhancement and Restoration (invasives removal and revegetation)	<p>Design of Habitat Enhancement and Restoration will be 100% complete by project start date (9/1/2011)</p> <ol style="list-style-type: none"> <li>1. Collected necessary site data</li> <li>2. Developed invasives removal and revegetation designs, plans and drawings</li> <li>3. Prepared and submitted annual notifications to regulatory/permitting agencies (USACE, CDFG, NCRWQCB) including designs, plans, and drawings to partners for review and comment</li> <li>4. Incorporated comments and completed designs, plans, and drawings.</li> </ol> <p>Note: Brief annual notifications will be prepared for each year of implementation work</p>	Habitat Enhancement and Restoration Design	N/A	10/2008	7/2011	100%
NA	Permit Development:  habitat enhancement and restoration	The Sonoma County Water Agency has obtained all permits for Copeland Creek habitat restoration and enhancement.	NCRWQCB Section 401 Water Quality Certification/Waste Discharge Requirements Permit U.S. Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 Permit California Department of Fish and Game (CDFG) 1602 Agreement of Routine Maintenance (ARM) Permit.	N/A	N/A	N/A	100%
2.1	Plant Propagation and Field Preparation	<p>Review project design</p> <p>Coordinate plant propagation with partner SSU</p> <p>Propagate plants</p>	Project Design	NA	9/1/2011	6/30/2012	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		Coordinate with SSU and North Bay Conservation Corps on field activities Prepare for field activities					
2.2	Field Implementation	<p>Habitat enhancement and restoration work will be performed under contract with SSU and North Bay Conservation Corps.</p> <ol style="list-style-type: none"> <li>1. Select contractor(s) and prepare contracts.</li> <li>2. Award and administer contracts with contractors</li> </ol> <p>Conduct inspection of the project including reporting and project communication</p> <ol style="list-style-type: none"> <li>1. Assign inspector to the project</li> <li>2. Keep daily records of activities, inspection, and progress</li> <li>3. Conduct regular meeting between the contractor and the inspector</li> <li>4. Assure drawings and other accumulated records are provided</li> <li>5. Initiate project implementation</li> <li>6. Order project equipment and supplies and arrange delivery to the site</li> <li>7. Assure project permits are in place</li> <li>8. Site Pre-implementation Meeting</li> <li>9. Review plans with contractor to ensure that invasive and exotic species are removed.</li> <li>10. Implement removal in accordance with the Sonoma County Water Agency Stream Maintenance Manual (SMP) and permits.</li> <li>11. Inspect removal</li> <li>12. Make improvements as needed</li> <li>13. Develop maintenance plan</li> <li>1. Contract with revegetation</li> </ol>	<p>Inspection Reports, Pay Requests, Meeting Minutes, Contractor Log, Submittals Invasive Species Removal Inspection Revegetation Inspection Implementation Completion Report</p>	2.1	4/1/2012	10/31/2013	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		contractor. 2. Review planting specs to make sure that plants used are propagated from locally collected native plant materials 3. Implement planting in accordance with the Sonoma County Water Agency Stream Maintenance Manual (SMP) and permits. 4. Install irrigation 5. Inspect revegetation 6. Make improvements as needed 14. Develop maintenance plan					
<b>3.0</b>	<b>Stormwater Detention Basins</b>						
3.1	90% Design to Final Design	The 90% design is the final, un-stamped, submittal. Complete plans and specifications are prepared, and a detailed itemized cost estimate is included. The 100% design is the design package that will be advertised for project award for construction/implementation of project. The package consists of the complete, signed, and "As-Advertised" plans and specifications.	Final stamped plans and specifications	A.3	4/1/2013	12/31/2013	0%
3.2	90% CEQA Development to Final – Storm Water Detention Basins	A certified CEQA EIR exists for the proposed site locations for the storm water detention basis. Because the storm water detention basins were not included in the CEQA project description, additional CEQA documentation is required. This task will take the 90% CEQA document to the final adopted document.	Final EIR	A.3	4/1/2013	12/31/2013	0%
3.3	90% Right-of-Way to Final	Finalize 90% ROW work; no specific ROW acquisitions required for Copeland Creek. The Sonoma County Water Agency has easements and modified		3.1	4/1/2013	12/31/2013	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		easements along Copeland Creek.					
3.4	90% Permitting to Final	Obtain the following permits: 1. Grading Permit 2. NCRWQCB Section 401 Water Quality Certification/Waste Discharge Requirements Permit 3. U.S. Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 Permit 4. Pre California Department of Fish and Game (CDFG) 1602 Agreement of Routine Maintenance (ARM) Permit and Streambed Alteration Permit 5. Prepare Construction Stormwater Pollution Prevention Plan	Copies of all permits	3.1	4/1/2013	12/31/2013	0%
3.5	Bidding and Award	1. Advertise the project 2. Conduct pre-bid conference 3. Prepare written responses to questions 4. Prepare Addenda 5. Receive and open sealed bids 6. Select contractor 7. Award and administer contracts with contractors	Milestone: Contract awards.	3.4	1/1/2014	3/31/2014	0%
3.6 and 3.7	Contract administration/construction  Environmental Mitigation/Enhancement during construction  Note: Water Agency procures a Labor Compliance Consultant with a state-approved program to implement all aspects of labor compliance including	Conduct inspection of the project including reporting and project communication 1. Assign inspector to the project 2. Keep daily records of construction activities, inspection, and progress 3. Conduct regular meeting between the contractor and the inspector 4. Verify that all work was completed in accordance with specifications 5. Assure drawings and other accumulated records are provided 6. Initiate project implementation;	Advertisement for bids Pre-bid meeting Bid evaluation of bids Contract award Inspection Reports, Pay Requests, Meeting Minutes, Contractor Log, Submittals	3.5	4/1/2014	12/31/2014	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
	prevailing wages.	conduct pre-construction meeting 7. Assure project permits are in place 8. Review and approve submittals					
<b>4.0</b>	<b>Project Performance Monitoring</b>						
4.1	Revised Monitoring Plan	Update the Monitoring Plan based on the post-construction testing of the original monitoring plan 1. Based on the use of identified monitoring techniques, update the monitoring plan if necessary 2. Provide a copy to partners and regulatory agencies if necessary 3. Incorporate comments 4. Final Monitoring Plan	Milestone: Revised Monitoring Plan	3.6	4/24/2014	8/27/2014	0%
4.2	Photo Monitoring	25% of implementation work has been completed. Photos and potentially video clips will be taken as the construction project progresses. 1. Develop photo documentation plan 2. Identify key construction steps to capture in photos 3. Set a regular schedule for collecting photos of the project.	Project photo documentation	3.6	4/1/2014	12/31/2014	0%
4.3	Project Close Out	Inspect project components and establish that work is complete. Test the operation of the pipeline, sewer connections, and treatment facilities. Prepare record drawings. 1. Establish work is substantially complete by inspector 2. Prepare a list of unfinished work 3. Test operation of distribution system, water tank, and well 4. Provide record drawings and accumulated documents to City 5. Prepare a notice of completion and provide to DWR	As-Built and Record Drawings Milestone: Completion Reports	3.6	1/1/2015	3/31/2015	0%

#	Work Task Title	Work Task Description	Deliverables and Milestones	Task Pre-decessor	Start Date	End Date	% Complete
		6. Prepare recommendations concerning final payments to contractors and release of retained percentages and bonds 7. Prepare final report.					
5.0	<b>After Project Closeout – not grant funded; not eligible as match.</b>						
5.1	Post Project Monitoring	Monitoring and testing will be conducted in accordance with the Monitoring Plan.		4.1	1/1/2015	12/31/2015	0%
5.2	Operations and Maintenance	1. Review SMP and permits for operations and maintenance requirements. 2. Implement SMP and permit O&M requirements.	SMP and permits	4.3	1/1/2015	12/31/2015	0%



**Santa Rosa Plain Groundwater Management Plan**

**Sonoma County Water Agency**

**Estimated Schedule**

<b><u>Task</u></b>	<b><u>Timeframe</u></b>
1: Organize Basin Advisory Panel	January to March 2011
2: Stakeholder Information Sharing	April to May 2011
3: Develop Goals and Basin Management Objectives	June to August 2011
4: Develop Monitoring and Data Collection Program	September to December 2011
Subtask for CASGEM outreach and implementation	January 2011to November 2011
5: Develop and Adopt Groundwater Management Plan	January 2012 to December 2012
6: Conduct Regional Information Sharing	January to March 2013

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**Attachments to this Section:**

- Project Elements Table
- Maps/Figures of the project location
- Map demonstrating that the project is not part of the State Plan of Flood Control
- Todd Engineers Figure 14 Selected Hydrographs
- Todd Engineers Figure 16 Water Level Contour Map 1951 - USGS Water Supply Paper 1427, Plate 2 (Cardwell, 1958)

**Project Elements Table**  
**Copeland Creek Enhancement and Restoration Project: Detention and Recharge Basins**  
**Proposition 1E Stormwater Flood Management Grant Application**  
**Sonoma County Water Agency and Partners**

Project Elements	Description	Status	Proposed Schedule	Implementing Agency
<b>LEVERAGED FUNDS</b>				
<b>Proposition 84 Implementation Round 1 Funding and Sonoma County Water Agency Match to those funds are leveraged funds and are <i>not</i> counted toward the Proposition 1E match; Caltrans Environmental Enhancement and Mitigation (EEMP) Funds and Sonoma County Water Agency Match to those funds are leveraged funds and are <i>not</i> counted toward the match.</b>				
Riparian Habitat Restoration Phase I	From Commerce Boulevard near Highway 101 to Joyce Court in Rohnert Park - Enhancement and restoration of 21 acres of riparian habitat along 9,400 linear feet of Copeland Creek by strategically removing 10 acres of invasive species and replanting with approximately 1300 upland trees, 1620 riparian trees, 3,360 upland shrubs, 3,360 riparian shrubs, 3,360 upland grasses, and 3,360 instream graminoids to stabilize creek banks and reduce sedimentation in areas at risk of erosion.	Design and CEQA completed (Final EIR) - Ready to Implement pending Proposition 84 Implementation Funds (Round 1); Caltrans EEMP funds awarded.	Plant propagation and field preparation 7/1/2011-2/15/2012  Field implementation 2/15/2012-6/30/2014	Sonoma County Water Agency (Proposition 84 Round 1 Implementation Funds, Leveraged with CA EEMP Funds; North Bay Conservation Corps
Sediment Removal Phase I	Removal of up to 11,000 cubic yards of accumulated sediment and re-contouring of up to 2 miles of channel bottom from the flood control channel, including construction of up to 3 in-stream sediment collection basins	CEQA completed (Final Amended EIR) - Ready to Implement pending Proposition 84 Implementation Funds (Round 1)	d Field preparation 2/1/2012-4/10/2012  Field implementation 4/10/2012-6/30/2014	Sonoma County Water Agency (Proposition 84 Round 1 Implementation Funds, Leveraged with CA EEMP Funds)
Stormwater Detention/ Groundwater Recharge Basins	Storm water detention of up to 200 acre-feet in two to three off-stream basins located in the alluvial fan east of Petaluma Hill Road yielding 150 acre-feet or more annual groundwater recharge potential, and improving groundwater supply reliability.	30,60,90% Design and CEQA Documents to be prepared pending Proposition 84 Implementation Funds (Round 1)	30,60,90% Design and CEQA Documents 7/1/2011-3/29/2013	Sonoma County Water Agency (Proposition 84 Round 1 Implementation Funds)To be procured: Design consultant, environmental consultant, construction contractor
<b>PROPOSITION 1E SWFM PROJECT ELEMENTS - MATCH FUNDED</b>				
<b>Federal Transportation Enhancement Match Funds – US Department of Transportation – Federal Highway Administration</b>				
Habitat Enhancement and Restoration Implementation and Regional Trail Development	Reconstruction of approximately 3900 LF of existing deteriorated Class I bicycle/pedestrian path along Copeland Creek; removal of non-native vegetation between the reconstructed/new path segments and Copeland Creek; planting of native vegetation where re-landscaping is needed along the reconstructed and new path segments.	Design and NEPA in progress. Federal Transportation Enhancement Funds for environmental and construction programmed in T-2035, funds for environmental obligated.	Implementation 6/1/2011-10/31/12	City of Rohnert Park (federal grant funds); North Bay Conservation Corps

**Project Elements Table**  
**Copeland Creek Enhancement and Restoration Project: Detention and Recharge Basins**  
**Proposition 1E Stormwater Flood Management Grant Application**  
**Sonoma County Water Agency and Partners**

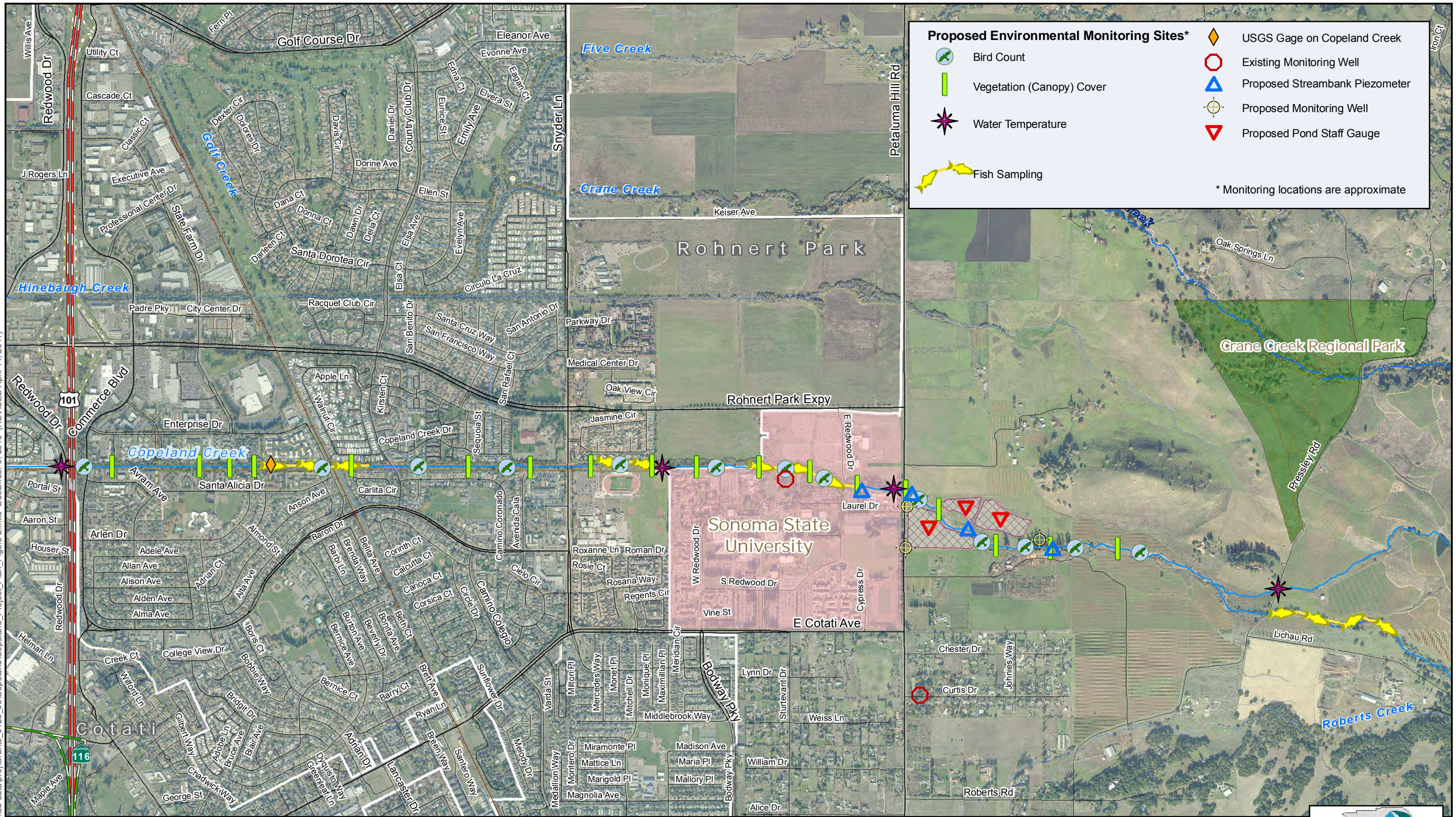
<b>Project Elements</b>	<b>Description</b>	<b>Status</b>	<b>Proposed Schedule</b>	<b>Implementing Agency</b>
Linking Open Space Resources and Urban Areas				
<b>Sonoma County Agricultural Preservation and Open Space District (SCAPOSD) Match Funds</b>				
Regional Trail Development Linking Open Space Resources and Urban Areas	Construct more than 6,000 linear feet of public trails from Sonoma State University east to Crane Creek Regional Park, and rehabilitate 6,000 linear feet of public bike paths from Sonoma State University west toward Highway 101 to expand regional parks, enhance recreational opportunities, and provide alternate commute options for pedestrians and cyclists and a virtually uninterrupted path from Rohnert Park to Crane Creek Regional Park.	Design and CEQA at initial stages (an EIR exists for portions of the project. Because certain locations were not included in the CEQA project description, additional CEQA documentation is required). Sonoma County Agricultural Preservation and Open Space District Funds awarded.	Design and CEQA 9/1/2011-12/31/2012  Implementation 1/1/2013-9/30/2014	City of Rohnert Park (Sonoma County Agricultural Preservation and Open Space District Funds), Sonoma County Regional Parks (match funds), Sonoma State University
<b>PROPOSITION 1E SWFM ROUND 1 PROJECT ELEMENTS</b>				
Riparian Habitat Restoration Phase II Stage 1	From Jasmine Court at Sonoma State University to 1 mile east of Petaluma Hill Road - Enhancement and restoration of 10 acres of riparian habitat along 6,600 linear feet of Copeland Creek by strategically removing invasive species and replanting approximately 900 riparian shrubs, and 1,800 instream graminoids to stabilize creek banks and reduce sedimentation in areas at risk of erosion.	Design - 85% complete; CEQA – 100% complete (Final EIR) - Ready to Implement pending Proposition 1E SWFM Funds (Round 1)	Plant propagation and field preparation 9/1/2011-6/6/2012  Field Implementation 2/16/2012-10/31/2013	Sonoma County Water Agency (Proposition 1E funds and Water Agency match funds), North Bay Conservation Corps, Sonoma State University
Stormwater Detention/ Groundwater Recharge Basins	Storm water detention of up to 200 acre-feet in two to three off-stream basins located in the alluvial fan east of Petaluma Hill Road yielding 150 acre-feet or more annual groundwater recharge potential, and improving groundwater supply reliability.	Design & CEQA to 90% pending Proposition 84 Implementation Funds (Round 1); Design & CEQA to 100% and construction pending Proposition 1E funds. A certified CEQA EIR exists for the Stormwater detention basins proposed site locations. Because the storm water detention basins were not included in the CEQA project description, additional CEQA documentation is required.	Design and CEQA (90% to Final) 4/1/2013-12/31/2013 Bidding and Award 1/1/2014-3/31/2014 Construction 4/1/2014-12/31/2014	Sonoma County Water Agency (Proposition 1E funds)  To be procured: Design consultant, environmental consultant, construction contractor







\\sd-data\proj\Grants\_0123\_08\Copeland\Copeland\_Plan\_Figure 2.mxd December 9, 2010 (REVISED April 14, 2011)



**Proposed Environmental Monitoring Sites\***

	Bird Count		USGS Gage on Copeland Creek
	Vegetation (Canopy) Cover		Existing Monitoring Well
	Water Temperature		Proposed Streambank Piezometer
	Fish Sampling		Proposed Monitoring Well
			Proposed Pond Staff Gauge

\* Monitoring locations are approximate

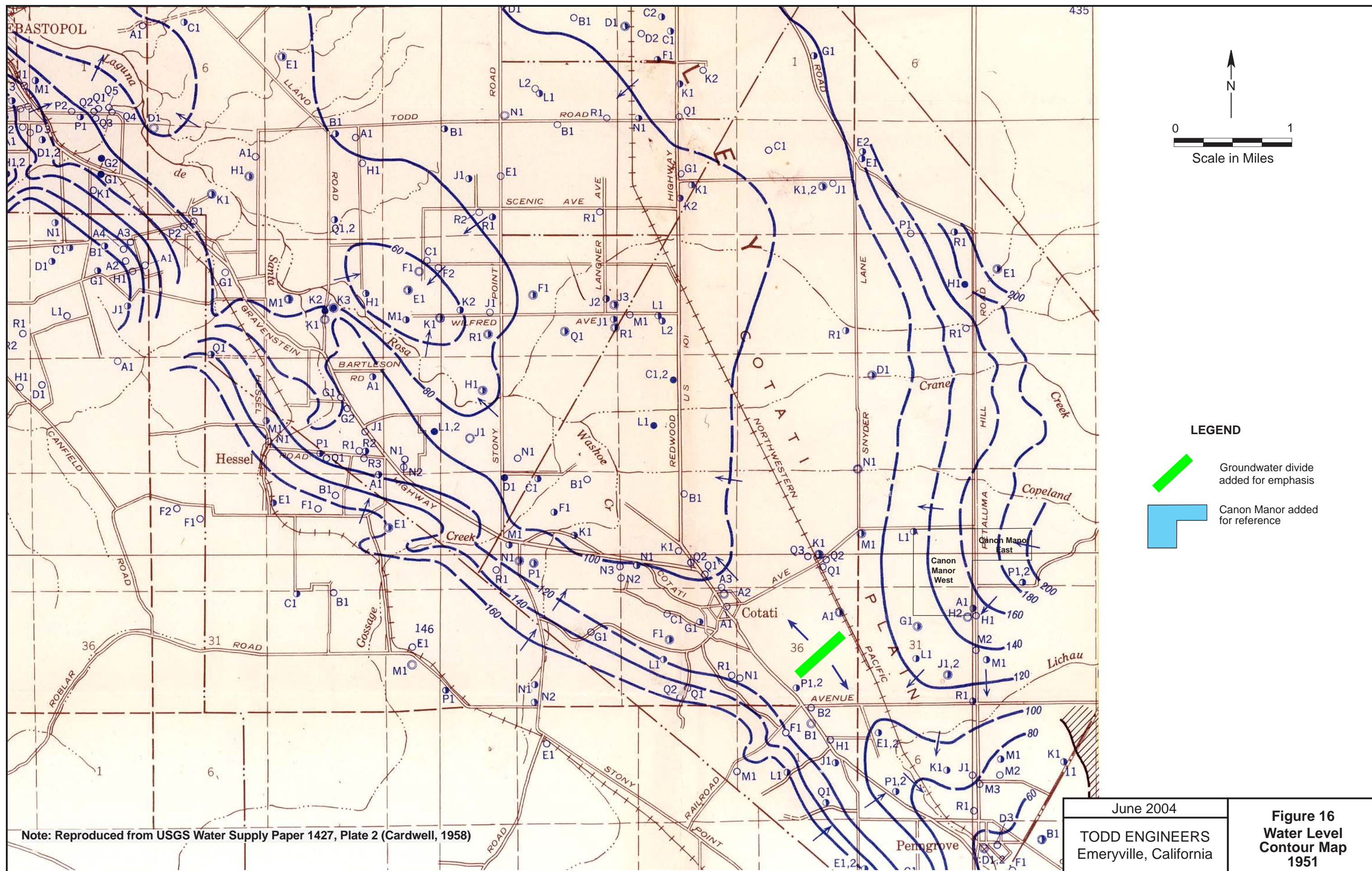
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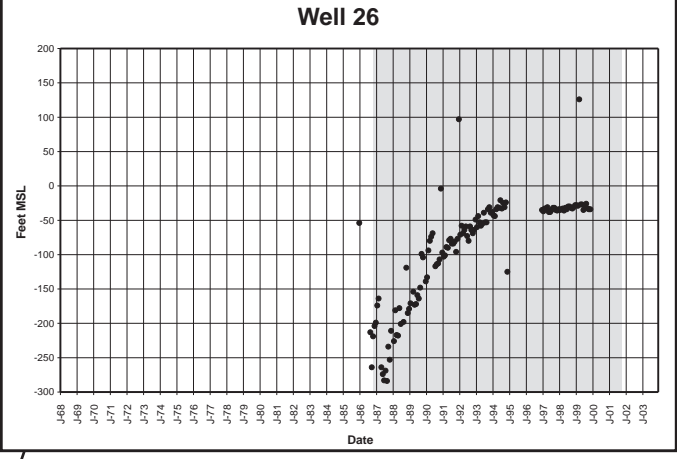
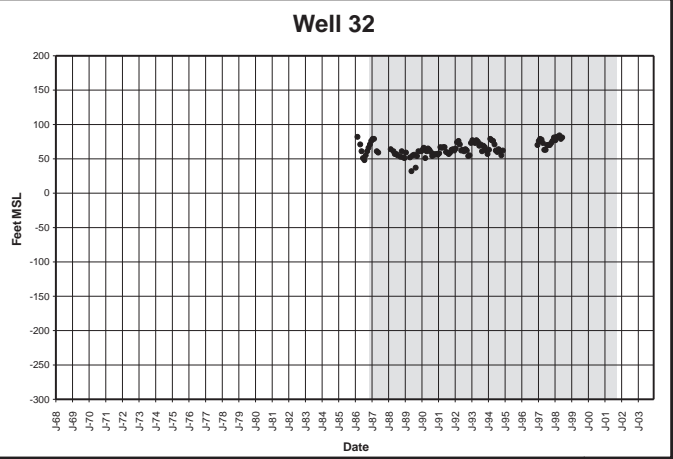
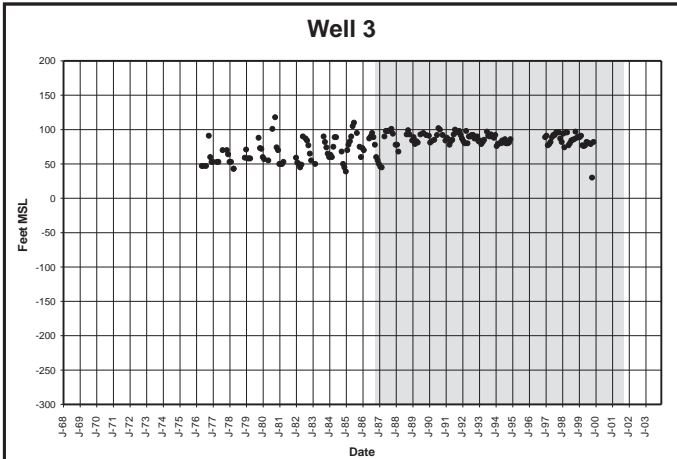


Figure 1-1. Sacramento and San Joaquin River Basins Planning Area for the State Plan of Flood Control

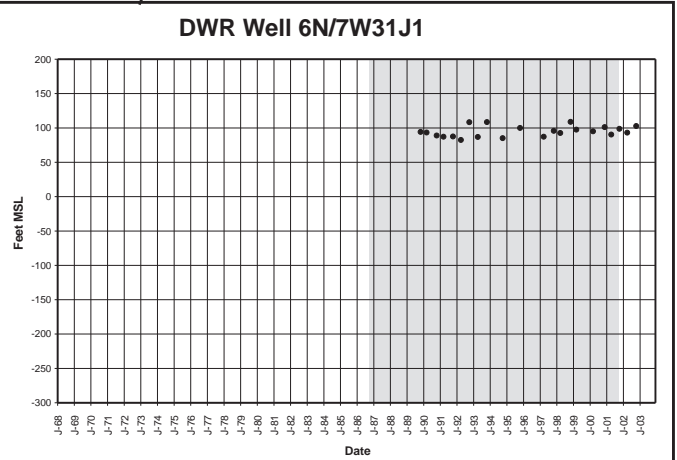
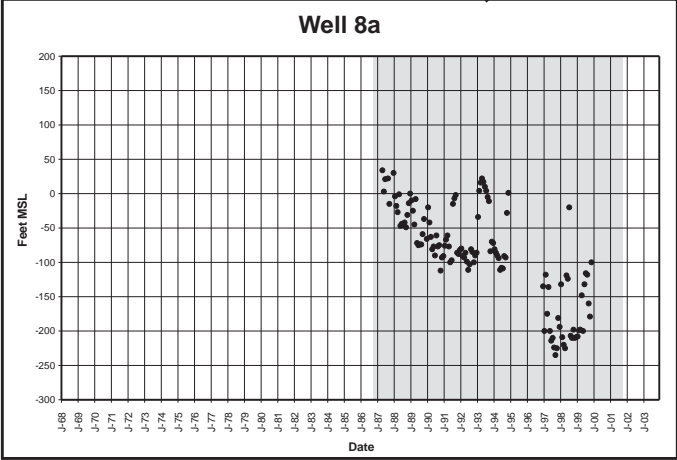
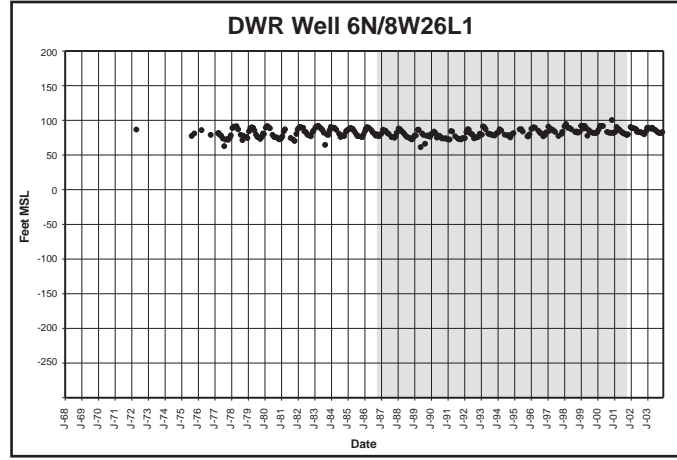
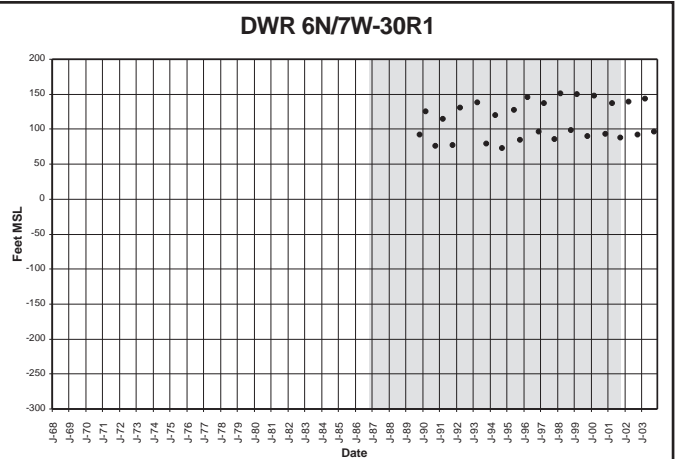
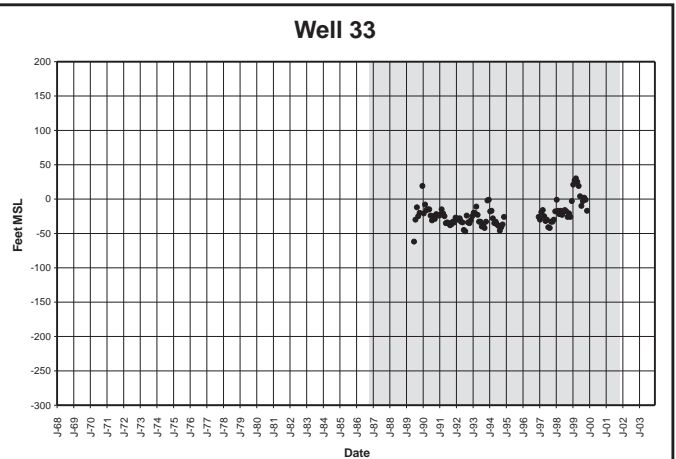
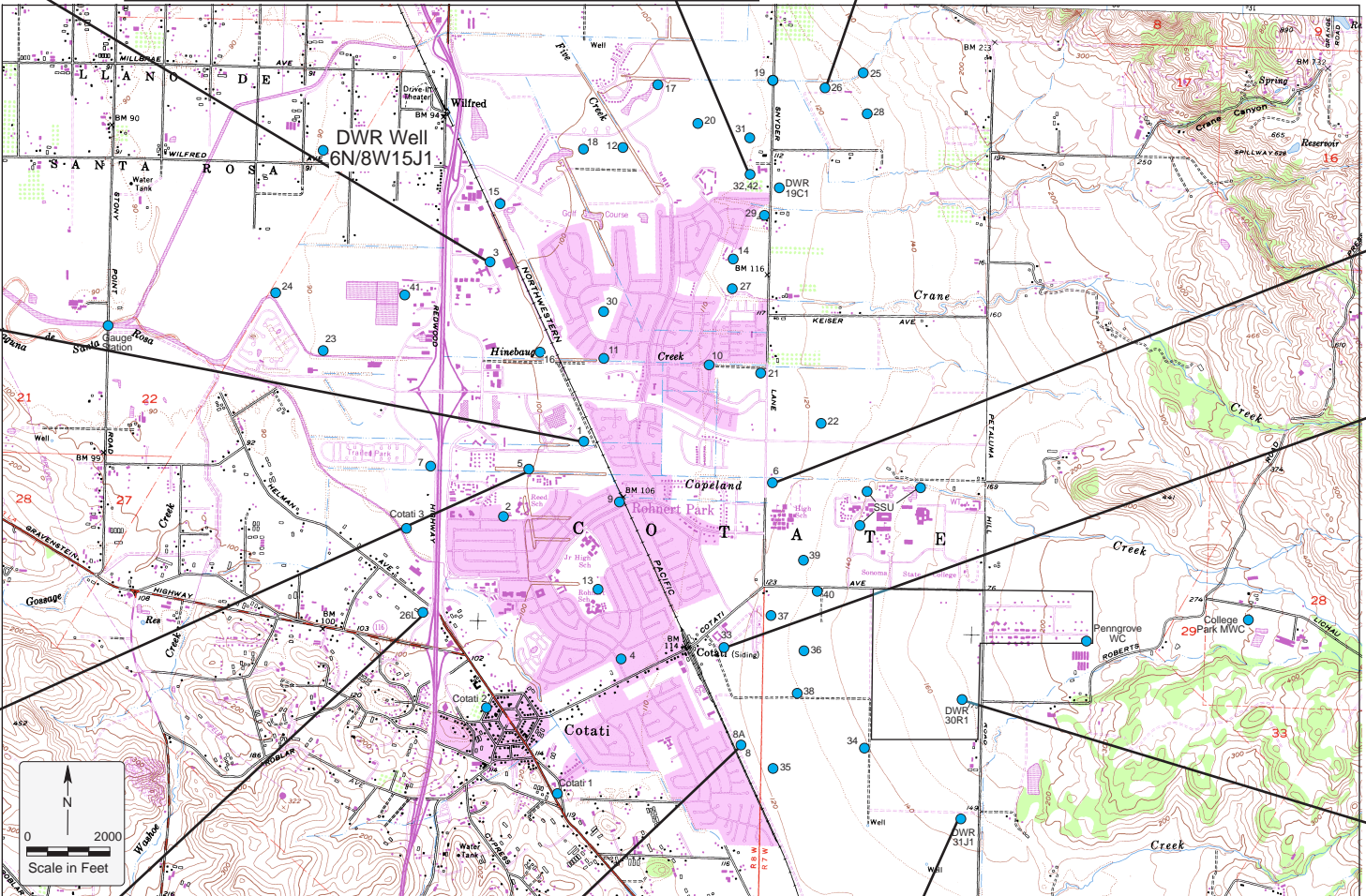
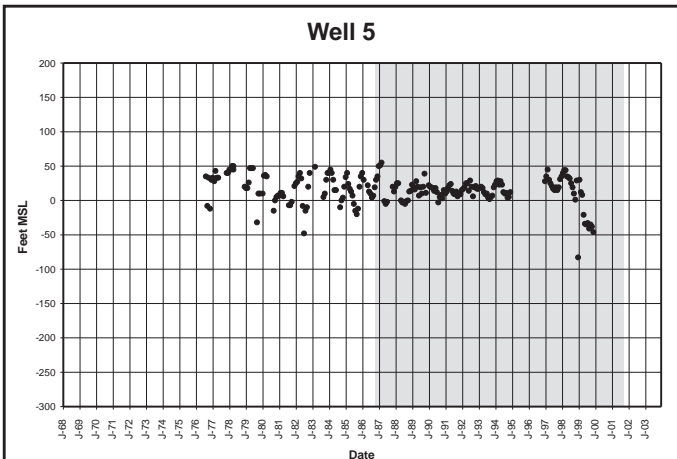
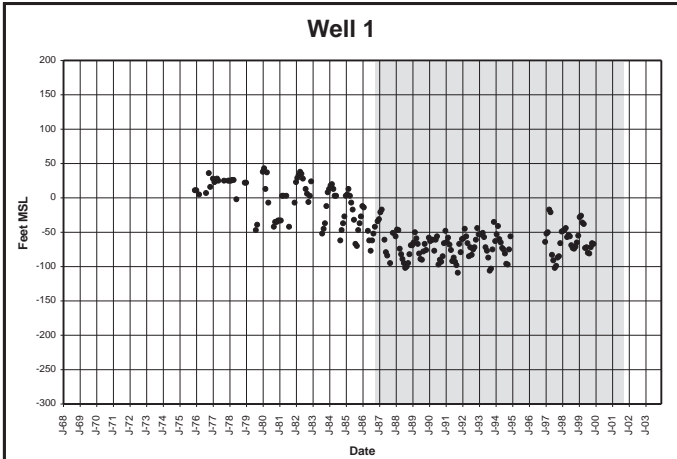
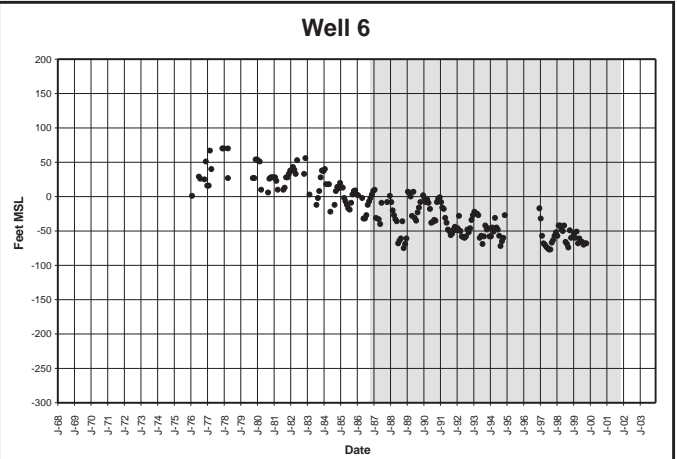








Shading indicates the water balance study period,  
water years 1986 - 1987 through 2000 - 2001.



June 2004  
TODD ENGINEERS  
Emeryville, California

Figure 14  
Selected  
Hydrographs